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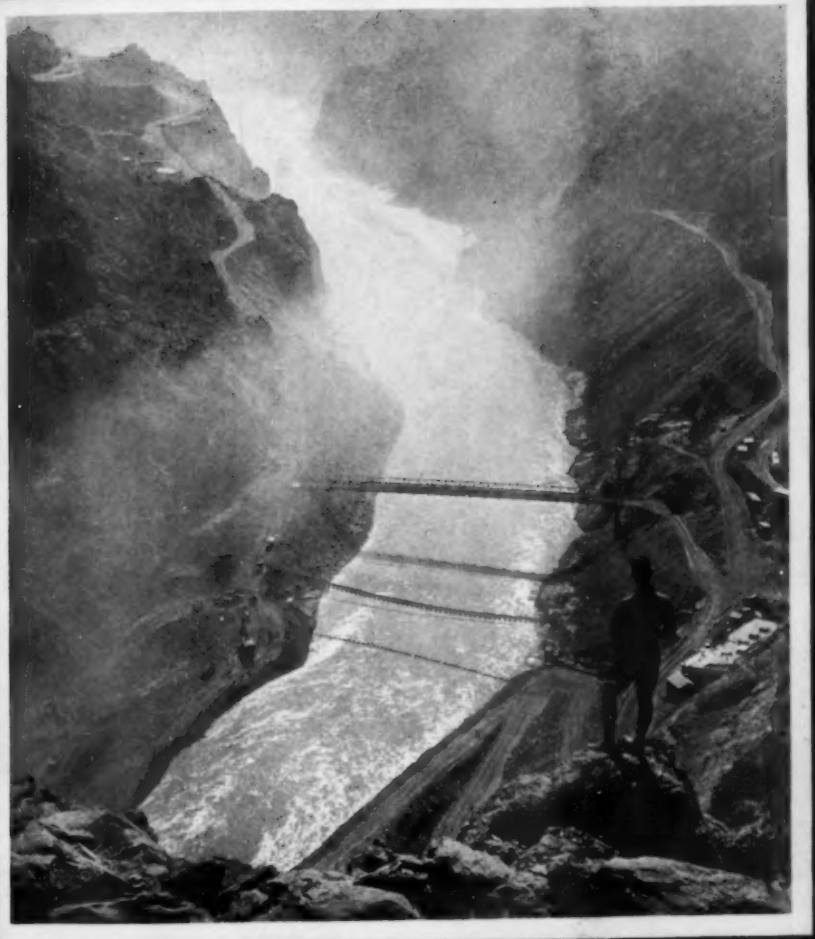
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



June 12, 1937

Looking Down the River

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A SCIENCE SERVICE PUBLICATION

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Gray foxes are good at tree climbing.

In spite of their name, no birds of the warbler family are fine singers.

Belgium, a leading world producer and exporter of glue, will try making it from shredded rabbit skins.

Tropical orchids have been known to suffer damage from midsummer heat in the greenhouses of a midwestern botanic garden.

Babylonian astronomers had a series of astronomical observations covering 360 years, but modern science has so far accumulated no series longer than 187 years.

The Goodnews Bay region of Alaska, which is reported to be having a platinum and gold mining boom, is to be mapped by two scientists of the Geological Survey.

The throne of Persian King Chosroes II. in the seventh century was a jeweled affair big enough to include seats for 300 nobles, and set on wheels so that the king could always face the sun.

Africa's black rhinoceros when frightened generally rushes toward the direction of alarm, in trying to escape.

The striped geese that range the island of Hawaii have lost many goose-like traits, becoming more like land birds than waterfowl.

The moon's highest mountain is believed to be about 24,000 feet high, in contrast with earth's Mount Everest, which is over 29,000 feet.

The Zoological Society of San Diego, California, recently secured a large number of snakes and other reptiles for the local zoo by holding a snake-catching contest.

A New Hampshire scientist has found a way to raise blueberries from seed to fruit-bearing stage in one year, instead of the usual four years required.

Two college professors have invented an easy chemical way of grading exams; the tests are printed in ink that turns blue or red when the student checks the right or wrong answer spot.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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RADIO

What invention may make home television a possibility? p. 377.

MEDICINE

New Researches Result in Drugs That May Aid Epilepsy

Brain Waves Basis for New Attack on Disease Leading To Sugar and CO_2 Treatment; Phenol Compounds Tried

THREE DRUGS which promise to be more effective than any now used in treating epileptic seizures and other attacks of convulsions were discovered in experiments reported by Drs. Tracy J. Putnam and H. Houston Merritt of Harvard Medical School. (*Science*, May 29.)

The drugs are diphenylhydantoin, acetophenone and benzophenone. They are related chemically to carbolic acid but are among the acid's less poisonous relatives.

Whether these drugs will prove of value in treating human patients "remains to be seen," the Harvard scientists state. Their effectiveness was determined in tests on cats. Electric shocks which would ordinarily produce convulsions in these animals failed to do so when the animals were given doses of any of the three drugs. Discovery that phenobarbital, one of the modern sleeping medicines, was more effective in preventing convulsions than any of the other barbital compounds led to trial of other phenol compounds from which the three reported were selected as most effective. Phenobarbital itself was found to be three or four times as effective as sodium bromide.

Science News Letter, June 12, 1937

SUGAR and carbon dioxide may prove to be sovereign remedies for epilepsy, it appears from results of brain wave studies in the disease reported by Drs. W. G. Lennox, F. A. Gibbs and E. L. Gibbs of Boston at the meeting of the American Neurological Association, in Atlantic City.

Brain wave studies gave the clue that has led to this suggestion of a method of attacking the malady. The wavy lines traced on paper, which show the fluctuations in electrical activity accompanying physiological activity in the brain, make characteristic patterns in epilepsy.

The epilepsy patterns suggested the approach or presence of a veritable brain storm. Further study showed that the difficulty was with the frequencies of the brain waves. The mechanism that regulated these frequencies was apparently out of order. The condition may now be compared to disturbances in heart or breathing rhythm.

The rate-regulating mechanism in the brain, the Harvard scientists stated, "behaves like an undamped pendulum; it tends to overshoot and to oscillate."

Inhalation of carbon dioxide or injections of sugar solution tend to stabilize the brain frequencies and to abolish abnormal brain rhythms.

Science News Letter, June 12, 1937

PORTRAIT OF A MUSICIAN

Little tree crickets, chirping their insistent songs, keep their filmy wings in strong vibration—for these are their vocal organs. Yet photography with modern apparatus is fast enough to "stop" this rapid motion, as witness this flash-bulb snapshot obtained with 1/50 second exposure at a 4.5 lens aperture by Percy A. Morris of the Peabody Museum of Natural History, Yale University.

PHYSIOLOGY

Brain in Epilepsy Like Leaderless Swing Band

EPILEPSY used to be called the "falling disease," but like so many other things, this disease that was known as far back as St. Paul's time has gone modern.

Radio and other methods of modern physics have been applied to its study and it now has a new name that brings it right into the age of swing music. In fact, it might not be going too far to compare the brain in epilepsy to a swing band without any leader.

The brain, medical scientists have found, has rhythm, just as the heart and breathing apparatus have. Study of so-called brain-waves, the records of the electrical activity that accompanies physiological activity in the brain, show this rhythm.

Normally the brain swings along, sending "hot" or slow according to whether a person is awake or asleep or working on some mental problem—arithmetic, for example. In epilepsy the rhythm is disturbed. Harvard University investigators, Drs. W. G. Lennox, F. A. Gibbs and E. L. Gibbs, have reported that the disturbance is due to something going wrong with the rate-regulating mechanism—the band leader, in other words, fainted or forgot to pay attention to his job.

In grand mal epilepsy, the brain is sending too fast as seen by the abnormally fast brain wave fluctuations. In psychomotor epilepsy the brain is sending too slow, the brain wave records show. In petit mal epilepsy, the brain alternates between the two, sending first too fast and then too slow.

The Harvard investigators have consequently given the condition a new name, paroxysmal cerebral disrhythmia, which is something of a jaw-breaker but to a scientist exactly describes the condition.

Inhalation of carbon dioxide or injections of sugar solution, they find, tend to stabilize the rate and abolish abnormal rhythms.

Science News Letter, June 12, 1937

ASTRONOMY

Harvard Astronomers Locate Largest Metagalactic Cloud

Vast Galaxy of Galaxies Could Hold 50,000 Milky Ways; Is 50 Million Light Years Long, 20 Million in Diameter

WHAT is probably the most extensive "metagalactic cloud" ever discovered, so tremendous that it may easily encompass 50,000 galaxies comparable with our own Milky Way, has been located and photographically studied by Harvard astronomers.

Shaped roughly like a narrow stream, it is estimated to be about 50,000,000 light years in length and 20,000,000 light years across. It is more than 100,000,000 light years distant from the earth, however, and despite its great size, its members are visible only through the most powerful telescopes. It is situated near the south pole of the heavens.

According to Dr. Harlow Shapley, director of the Harvard Observatory, who announced the find, the cloud is of particular interest to astronomers not only because of its tremendous size but because it is expected to be of much importance in studying the complex space-time-matter relationship in our "immediate" neighborhood, astronomically speaking—that is, out to about 100,000,000 light years. It emphasizes the lack of uniformity in the space distribution of galaxies.

Astronomers have for some years been aware of the existence of so-called super-galaxies—clusters big enough to contain several hundred Milky Way systems. Until this most recent find, however, there has been no evidence of galaxies much larger than these—certainly not for any as large as the one just found.

The new cloud was discovered on photographic plates taken at Harvard's southern station during a more or less routine survey of all galaxies brighter than the 18th magnitude. At first it was classified as merely a "major irregularity" in the distribution of faint galaxies in the southern skies.

The photographic plates, actually show only about 15,000 galaxies, all of them between the magnitudes of 16.5 and 18.5, but judging from other super-galaxies Harvard astronomers have assumed that many members are too faint to show on the plates and have placed the probable complete census at more than 50,000 galaxies.

Astronomically speaking the cloud extends over a region about 40 degrees in length and 15 degrees in width, from near the sky's south pole toward the south galactic pole in Sculptor.

Science News Letter, June 12, 1937

ASTRONOMY

Eros Shaped Like Huge Brick Tumbling End Over End in Sky

THE ERRATIC fluctuations in brightness of the tiny planet Eros which have puzzled astronomers for four decades and made the body one of the most mysterious in the heavens, have been explained by Fletcher Watson, young research fellow of the Harvard Observatory.

The solution, he says, lies in the fact that instead of having the usual round form that characterizes the earth and other planets, Eros is shaped like a huge brick.

Revolving end over end, showing first a small end and then a large side, Mr. Watson believes, the planet appears to have rapid changes in brilliance. At other times, he says, the body whirls about with a large flat side toward the earth and this accounts for its occasional periods of constant brightness.

Add to this Mr. Watson's discovery that Eros is revolving "backwards" and it is even more understandable why its erractic fluctuations in light have baffled astronomers.

These fluctuations have been one of the greatest sources of interest in the planet since it was discovered in 189[illegible]. Astronomers have been unusually attracted by its capricious brightness, sometimes constant for months on end and then without warning changing as much as an entire magnitude within the short space of two hours.

Eros is also of interest because it is one of the earth's nearest neighbors. It is a cold mass of rock, hardly 22 miles long by seven miles thick. It travels around the sun in 643 days, passing out beyond Mars on its outer trip yet occasionally coming as close as 14,000,000 miles to earth.

It is now moving toward earth and will be at its closest next January. According to Mr. Watson's predictions, it will show small changes of brightness this summer and fall. They will become larger in January and reach a maximum Feb. 2, 1938. They will then decrease very speedily, and by the end of March the light will become practically constant for a lengthy period.

Harvard Observatory will make a series of photometric observations testing these predictions and with them Mr. Watson's theory during the next year.

Science News Letter, June 12, 193[illegible]

MEDICINE

Wars Won With Quinine Instead of Artillery

MEDICAL men can point with pride to their achievements in the field of military medicine. If in the future men are determined to kill each other in wars they can be sure they will meet their death in or because of battle. They will not be killed or kept out of the fray by the diseases which used to take more lives of fighting men than guns or swords.

How preventive medicine has triumphed in this field appears in a report of Sir Aldo Castellani, newly-created Count of Kisymaio, who was Inspector General of the Italian Army and Navy medical services during the Italo-Ethiopian War.

More than 20,000 men in the Italian Army should have died of disease, according to experience of previous colonial wars in tropical countries in which white troops were chiefly employed, Sir Aldo points out. The actual number of deaths from disease was 599, and this included deaths from motor accidents and drowning.

Malaria, expected to be the chief

scourge of the white troops, was kept at a minimum, with the number of deaths "infinitely lower than expected," by quinine. Each soldier was given 3 tablets a day and took them, example of the officers being the chief coercive measure.

Dysentery, the "blood flux" which generals used to fear more than the enemy, did not take a single life and affected only 453 men, whereas at least 80,000 to 100,000 might have been expected. The preventive measures against this disease were three-fold: 1. Every effort was made to give the officers and men pure drinking water; 2. The men were encouraged to wash or disinfect their hands with lysol, especially before meals, and cooks and others working in the kitchen were required to use this disinfectant; 3. The "grandmotherly precaution" of wearing a flannel abdominal belt was enforced on every soldier, to prevent abdominal chilling which might predispose to dysentery.

Science News Letter, June 12, 1937

MEDICINE

Attack on Cancer Under Way; Now Trying to Make Vaccine

Proteins Combined With Coal Tar Derivatives Tried In Efforts to Produce Antibodies in Animals

EFFORTS to fight cancer by vaccination are under way at the Banting Institute, Toronto, Drs. W. R. Franks and H. J. Creech of the Institute reported at the meeting of the Royal Society of Canada.

The work is still in the experimental stage. Protection of humans has not been tried and will not be until results of animal tests now under way show whether or not the material made in the Banting laboratories is a cancer vaccine.

"We have no evidence that we have succeeded in producing a vaccine to protect against cancer," Dr. Franks stated in reply to inquiry by Science Service.

Used on Guinea Pigs

Various proteins, the class of chemicals to which egg white belongs, have been combined with cancer-producing chemicals such as certain anthracene or coal tar derivatives, Drs. Franks and Creech reported at the meeting. This material was injected into rabbits, guinea pigs and rats. After the injections, the blood of these animals contained substances called antibodies which united with cancer-producing chemicals and it is hoped will check their power to cause cancer.

"We do not yet know," Dr. Franks told Science Service, "whether the union between the antibody produced in animals and the cancer-producing chemicals checks the power of the latter to cause cancer."

The next step, now under way, is to determine this by injecting the material into animals and then observing whether they are protected against development of cancer experimentally produced by various known methods.

Science News Letter, June 12, 1937

PUBLIC HEALTH

Rabies Found to Occur At Any Season of Year

THE CRY of "Mad Dog!" will soon be heard over the land. Not that dogs go mad, or suffer from rabies, any oftener during the dog days of midsummer than at any other season. But from April to September dog bites are more frequent because at this season more dogs are running loose.

Rabies gets its other name of hydrophobia from the fact that at the height of the disease swallowing is so difficult the afflicted person or dog will refuse even water. The choking, huskiness and shortness of breath are due to spasms of the muscles of swallowing and breathing. In the later stages, the spasms and convulsions may affect the whole body. Death occurs from paralysis of the breathing muscles.

This truly horrible disease is caused by a virus, one of those ultramicroscopic substances which latest scientific discoveries show may be chemicals rather than living organisms. When a rabid dog or other animal bites, he passes the virus to his victim through the saliva.

LIVING ON A HAT

The sprightly cluster of silver-green leaves with which this young lady's hat is trimmed is a real living plant. It is one of the numerous kinds of air plants (bromeliads, to botanists) that grow on the limbs of trees along the Gulf Coast and in peninsular Florida. They are first cousins to Spanish moss and second cousins to pineapples. All they need is a little water occasionally in the tiny cup-like cavities at the leaf-bases, mineral nutrients that come in stray dust, and plenty of free air. And they'd just as lief ride on a pretty girl's hat as roost on a tree—perhaps rather, who knows?

Pasteur treatment is almost 100 per cent. effective in preventing rabies. It can be given at any private or state laboratory or by any physician and should be started as soon as possible after the bite. The disease begins usually within 2 or 3 weeks after the bite.

A dog or other animal suspected of having rabies should not immediately be destroyed, even if he has bitten someone. He should be kept penned up for at least ten days and watched to determine whether or not he has the disease. The diagnosis is confirmed by microscopic examination of the brain, but this is difficult to do if the dog has been shot and the brain severely injured.

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ASTRONOMY

It's 1500 Degrees Cooler in Sun's "Air" Than On Its Surface

Intensity of Dark Bands in Absorption Spectrum Gives Clue to Major Temperature Differences

AN UNEXPECTEDLY large temperature drop of 1500 degrees Centigrade between the surface of the sun and its overlying atmosphere has been found by Harvard astronomers to add to the mysteries of that complex body.

Perfection of a comparatively new technique of measuring the heat of the sun's gaseous envelope, one that employs delicate spectrum analysis, made possible the discovery. With it, the astronomers have calculated the temperature of the sun's atmosphere to be about 4500 degrees Centigrade.

Previous measurements of the heat at the sun's surface, the starting point of sunlight, have given scientists a figure of 6000 degrees Centigrade, which with the new figure for the temperature of the envelope indicates a falling off of 1500 degrees.

A small temperature drop had been expected but Harvard astronomers were entirely unprepared for the large decrease in heat between the sun surface and its outer atmosphere as shown in the new measurements.

The research was conducted by Prof. Donald H. Menzel, Leo Goldberg, Bemis fellow of the Harvard observatory, and James G. Baker, a graduate student in astronomy.

In the project the astronomers used the black lines found across the ordinary solar spectrum. These lines are formed as the sun's light passes through the solar gas envelope with each atom in this atmosphere absorbing its own characteristic colors from the sunlight. The result consists of periodic dark shadows across the familiar rainbow band.

Inasmuch as the intensities of these shadows or lines depend to a large degree on the relative heat of the light source, they can be used as a "thermometer" or guide to the temperature of the source.

This relatively new type of research was begun at Harvard several years ago when Mr. Goldberg undertook calculations of the theoretical intensities of related lines in the spectra of various elements. Dr. Menzel extended this quantitative theory of line formation and more recently applied the research as a key to solar temperatures.

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GEOGRAPHY

Scientists Will Be Human Drift Bottles

FOUR Russian scientists sitting on the Polar ice floe in their tight little hut to keep them warm, will still be sitting there next spring if all goes well. But also they will not be there. That is, they will doubtless be in the same hut, and the hut on the same ice, but the ice will have moved.

In this, "Little Russia" at the North Pole is unlike "Little America" of a few years ago on the edge of the Antarctica. Admiral Byrd's camp, being on solid land, stayed put; the Soviet scientists' camp, being on floe ice, will drift. And in drifting it will have a chance to find an answer to one of the important and obscure questions of oceanography; What sea currents are there in polar waters, whither and how fast do they flow?

No one has any idea of the answer now. Even among leaders of the expedition agreement is lacking. Academician O. J. Schmidt, leader of all Soviet scientific activities in the Arctic, believes the floe will move toward America. Peter Shirsov, oceanographer, who is staying in the tent at the Pole, thinks it more likely that the movement will be in a circumpolar drift.

The Arctic over-winterers will have a chance to know part of the answer while they are still up there. They have accurate astronomical instruments for taking position shots at sun and stars, and constant radio time-signals, so they will be able to check their position within a few hundred yards at any time. The four men will be like drift bottles in the sea, except that they will know whither they are drifting.

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METEOROLOGY

American Meteorologists To Spend Year in Arctic

THE RUSSIAN scientists who have "colonized" the North Pole are going to have American neighbors. An expedition led by Clifford J. McGregor will spend the coming year at Fort Conger, on the coast of Grant Land, directly opposite North Greenland, making an intensive study of polar weather.

The expedition is privately financed and organized, and will not be participated in officially by the U. S. Weather Bureau. However, the Weather Bureau has loaned a full equipment of scientific instruments: thermometers, barometers, wind-measuring devices, balloons and observing instruments for high-altitude work, and meteorographs to be carried on the expedition's aircraft. Daily data will be transmitted to the Weather Bureau headquarters at Washington, D. C.

The radio equipment carried by the expedition will make conversation with the Soviet polar "colony" easy, if the two parties want to talk to each other.

The base to be occupied by the scientists, Fort Conger, is the same one used by Gen. A. W. Greely in the 1880's, when 80 degrees north latitude was still a world record. Fort Conger lies in 82 degrees north latitude, 66 degrees west longitude. Grant Land constitutes the northernmost section of the large land mass known as Ellsemere Island.

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Clothes moths can live five years without food.

Aztec Indians of Mexico called "measuring worms" by similar name in their own language.

CHEMISTRY

Poles Have Cyanide War Gas, German Scientists Conjecture

Carbonylcyanid, Recently Made for First Time in Lemberg, Said to be More Stable than Wartime Phosgene Compounds

POLAND may have succeeded in making the long-sought war gas containing the deadly cyanogen in effective combination, a German science journal suggests. (*Ber .d .deutschen chem. Ges.* 70, p. 1012).

Cyanogen is the deadliest of all known gases, quicker and more inevitably fatal in its action even than carbon monoxide. But like carbon monoxide it is light and highly volatile, so that in the open air it is quickly dispersed and therefore ineffective as a poison gas for military purposes.

During the World War several powers, particularly France, tried to make a compound containing cyanogen. A phosgene-cyanogen combination was the favorite experimental aim, but results were discouraging.

Now the report reaching the German Chemical Society states, Polish scientists at the University of Lemberg have succeeded in preparing a compound which they call carbonylcyanid. It is a clear, limpid liquid, with boiling point at 65.5 degrees Centigrade, considerably below that of water but much higher than that of cyanogen itself. In pure state it is quite stable. In contact with water it breaks down explosively into carbon dioxide and cyanogen.

Its physiological effects have not been reported by the Lemberg chemists, but the German editor remarks that "it is possible that the new compound has a very high toxicity; and its relatively high boiling point makes its use as a war gas not improbable."

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A BIRD-SHELTERING MEMORIAL

Audubon, the great early American naturalist, would delight in this tower of homes for birds which is the accent-note of the museum and headquarters building in Audubon Memorial Park, near Henderson, Ky., where the continent-wandering artist-scientist once owned a mill. The work is being carried out as a cooperative project; bird-lovers made the Audubon Society their medium for the contribution of $73,000, and the building is being put up as a W.P.A. project with C.C.C. collaboration. It is hoped that formal dedication can take place in the autumn

AGRICULTURE

Heat, Rather Than Drought Blamed for Corn Failure

EXCESSIVE heat in drought years is a more potent cause of corn crop failure than lack of water, declares Senior Meteorologist Charles D. Reed of the U. S. Weather Bureau Station at Des Moines, Iowa.

In support of his thesis, Mr. Reed cites recent drought history in his own state:

"In 1934, summer precipitation averaged 2.08 inches greater than in 1933 in Iowa, yet there was a bumper corn crop in 1933 and nearly a corn failure in the southern counties in 1934, because of the excessive and prolonged heat, with an average of 19.7 days with temperatures 100 degrees or higher, the greatest of record up to that time. This cut the 1934 corn yield to 21.6 bushels as compared with 14 in 1894.

"Then came the calamitous summer of 1936. The heat of July and August averaged 81.3 degrees, surpassing by 3.2 degrees the record hot July and August, 1901, with an average of 25.6 days 100 degrees or higher.

"During the last half of July, 1936, the Iowa crop was reduced 235,000,000 bushels to an average yield per acre of about 17 bushels . . . . In small areas the destruction was even more complete than in 1894. Whole townships in the south part of Plymouth and the central part of Woodbury counties, reported only two or three wagon loads of corn.

"We used to say, 'It can't happen in Iowa,' but like the Californians, we must reluctantly admit that we had some unusual weather."

Discussing the much-debated question of weather cycles, Mr. Reed finds some difficulties, but also offered sweltering humanity promise of some relief:

"Considerable has been said about precipitation cycles but since precipitation is a resultant of many complex factors of which temperature is the major one, the search for precipitation cycles is not likely to be very fruitful. There is, however, a rough rhythm to the temperature graph for the State of Iowa which can, with a little imagination, be divided into cycles or periods after eliminating volcanic and other influences.

"There is little doubt that we have just passed a historic peak in the temperature cycle that must be followed by a summer in 1937 much cooler than recent summers and probably averaging near or slightly below the long time summer average. And the cycles that have gone before lead one to believe that there will be a tendency for the next 2 or 3 summers to grow cooler."

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Ninety-nine per cent. of the native plant life of North America has been replaced by foreign kinds.

PUBLIC HEALTH

System of Group Payment For Medical Care Spreading

MANY steps toward solving the problem of the costs of medical care by a system of group payment have already been taken, it appears from a report of Dr. Esther Lucile Brown of the Russell Sage Foundation. Dr. Brown's report, the fourth in a series of studies in professions, has been released by the Foundation.

"Widespread application of some system of group payment," it is suggested, "might lead to a greatly enlarged demand for service by the middle class, and might also relieve the health professions from the burden of having to render so much service for which they receive little or no remuneration."

Among the beginnings in this direction, Dr. Brown points out that by 1930 over half a million wage earners in the mining and lumber industries of twenty-one states were eligible through the industries themselves to more or less complete medical care on a fixed, periodic payment basis.

Under workmen's compensation laws, some $80,000,000 is paid out annually for medical services to injured workers, these funds coming almost solely from the employers. The rapid recent spread of group hospitalization plans is a further extension of the group payment principle.

Public expenditures for disease prevention through departments of health, and for hospitalization, particularly of the tuberculous and the mentally ill, have steadily mounted. According to the estimate of the Committee on the Costs of Medical Care, 14 per cent. of the costs of health and medical services in the United States in 1929 were financed by taxation.

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PALEONTOLOGY

Extinct Shark-Like Animals Demoted to "Missing Link"

FOSSIL sea-creatures that scientists have always regared as sharks were demoted to the lower position of missing links between the true fishes and more primitive forms like lampreys, by Prof. David M. S. Watson of University College, London, in an address before the New York Academy of Sciences.

The extinct shark-like animals are known as acanthodians. The name comes from the Greek word for thorny or spiny; the acanthodians were rather prickly customers in their day. Each body fin was armed in front with a stout, sharp spine. They appeared first in Devonian times, about 300,000,000 years ago, and lasted about 100,000,000 years, until the Permian.

Acanthodians were always taken to be primitive sharks because of their general body outline and because such remains of their skeletons as were found appeared to be in general shark-like. However, Prof. Watson has found such marked differences in braincase, jaws, gill arches, and other structural elements that in his opinion it is evident "they belong to a grade of structure more primitive than, and in a wide sense antecedent to, that of the true fish."

He therefore considers them to be a special and separate group of vertebrates, lower than the fishes and intermediate between them and the more primitive lamprey group.

Science News Letter, June 12, 1937

GENERAL SCIENCE

Launch New Study of Science Aids to Learning

A COMPREHENSIVE survey of how radio, sound recording and reproduction, motion pictures, photography and other scientific achievements may be applied to promotion of learning is to be conducted by a special committee of the National Research Council.

Dr. Irvin Stewart, now vice-chairman of the Federal Communications Commission, will head the active investigations as director upon the expiration of his term on the FCC June 30. President James B. Conant of Harvard is chairman of the committee consisting of Dean Vannevar Bush of Massachusetts Institute of Technology; President L. D. Coffman of the University of Minnesota; Dr. Frank B. Jewett, president of Bell Telephone Laboratories; Prof. Ben D. Wood of Columbia University; Bethuel M. Webster, New York attorney, and Dr. Ludvig Hektoen, chairman of the National Research Council.

The new committee on scientific aids to learning will establish offices in New York and appoint experts and consultants to aid in its inquiries. The first activity will be in the field of educational broadcasting and will consist of a survey of the work and experience of the National Advisory Council on Radio in Education. Funds from the Carnegie Corporation will support the committee's activities.

Science News Letter, June 12, 1937

IN SCIE

ECOLOGY

Castilla Rubber Trees Suggested for Florida

RUBBER'S importance in war has been popularly recognized ever since Gallieni's army rode to battle in Paris taxicabs, to check the outflanking Germans on the Marne. Germany, with no rubber-growing colonies, desperately makes costly synthetic *Ersätze*. Soviet-land plants latex-bearing weeds wholesale on the steppes. Britain mounts the world's most ponderous guns at Singapore, the gateway for most of the world's plantation rubber.

A possible reservoir for emergency supplies of rubber for the United States, on what is now wasteland in southern Florida, is suggested by Dr. O. F. Cook of the U. S. Department of Agriculture, in a communication to *Science*. These lands, Dr. Cook points out, are in need of reforestation, and he asks why should they not be planted to the rubber tree that the ancient tropical American Indian civilization knew, *Castilla*.

Castilla was once a more widely distributed rubber tree than the one that now dominates the world's rubber market, the Para rubber tree or *Hevea*. The latter has come to its leading position because its internal anatomy makes it more suitable to the economical harvesting of latex by tapping. *Castilla* would yield its rubber most advantageously if the whole tree were felled and the rubber taken out of its bark by mechanical means.

This of course would be a destructive method of harvesting rubber. But since the projected Florida plantings would be intended only for emergency use, when this destructive but rapid method of harvesting would be more or less justified, it need not be of primary concern.

Another use suggests itself: Para rubber trees take some years to come into bearing, and under some conditions require the partial shelter of "nurse" trees while they are young. Why not, asks Dr. Cook, let *Castilla* trees take over this job, so that when the nurse trees must be removed they will anticipate the *Hevea* yield with a preliminary rubber harvest of their own.

Science News Letter, June 12, 1937

EE FIELDS

ARCHAEOLOGY

Big Prehistoric Hoard Of Indian Corn Found

ONE of the greatest hoards of prehistoric Indian corn ever found in the Mississippi Valley is reported by Robert McCormick Adams, excavating an old Indian settlement at Wickliffe, Ky.

Several thousand grains of the corn, charred by fire, were found under the floor of an Indian building near the fireplace, the archaeologist reported. Fire, which wrecked the whole structure, may explain why the Indian store of food was never eaten.

Skeletal remains of Indians who lived at the prehistoric settlement are also coming to light in the excavations, Mr. Adams said.

Science News Letter, June 12, 1937

ECOLOGY

South African Sheep Bush Thrives on Arizona Desert

KARROO or sheep bush, one of the principal forage plants for sheep in the South African desert plateau areas in times of severe drought, is now being propagated by the nurserymen of the U. S. Soil Conservation Service for seed increase, since this plant has demonstrated extreme drought resistant possibilities and adaptability to the American desert.

Sheep bush has covered the desert plateaus of South Africa for centuries. Gradually it became evident that this shrubby perennial was a most dependable forage plant. Becoming so dormant during the dry season that it appears to have died, it comes to life with almost miraculous quickness with the beginning of rains.

The original introduction of the karroo or sheep bush into the United States was made more than 35 years ago by Dr. David G. Fairchild, for many years head of the division of foreign plant introduction of the Bureau of Plant Industry. First plantings were made from a packet of native African karroo seeds in the plant-introduction gardens at Chico, Calif. After that, for many years, little attention was given to the plantings.

Then came the recent drought emergency, and a small amount of seed was furnished the Soil Conservation Service for experimental planting under Southwestern arid conditions. So the sheep bush, along with some 30 or 40 other species of widely varying growth habits, was planted in the Arizona desert.

After a year or two all of the species thus planted had disappeared, with the single exception of the sheep bush. This is taken as a thoroughly convincing experimental result from the point of view of the Soil Conservation Service.

Science News Letter, June 12, 1937

PHYSIOLOGY

Faulty Nutrition May Cause Popping Eyes in Goiter

FAULTY nutrition may be the cause of the popping or bulging eyes characteristic of the type of goiter known as Graves' Disease, Dr. David Marine of Montefiore Hospital, New York, told members of the International College of Surgeons meeting in that city.

This eye symptom in goiter has long been a medical mystery, Dr. Marine explained. In the past 10 years it has become more pronounced as a symptom following removal of most of the thyroid gland to remedy Graves' Disease. The reason for the bulging eyes, following operation, Dr. Marine believes, is the removal of the protective action of the thyroid gland. Feeding dried thyroid to guinea pigs and rabbits prevents and often cures the eye condition.

Although the condition is evidently due to lack of thyroid gland secretion, the eyes do not bulge in cretins, patients suffering from severe thyroid insufficiency.

"Obviously many other factors than that dependent on thyroid insufficiency are involved," Dr. Marine stated.

In rabbits, males are much more susceptible to the condition than females. The same is also true in the post-operative eye condition in humans, that is, men are more apt to develop bulging eyes after thyroid removal than women in the ratio of 3 to 2. From this Dr. Marine concludes that "the same basic disturbance in nutrition is involved in both man and rabbit."

This disturbance involves deficient thyroid secretion, hyperactivity of the anterior pituitary, some sex gland insufficiency and an abnormal calcium and phosphorus metabolism.

Science News Letter, June 12, 1937

MEDICINE

Students Warned Against Pep Pills at Examinations

WARNING to students facing final examinations not to use so-called pep pills (benzedrine sulfate tablets) was issued by the American Medical Association.

The pills do relieve fatigue and stimulate the mind temporarily, but cases of collapse, fainting and insomnia (sleeplessness) following their use have been reported to student health physicians. Using these tablets to replace sleep and study is about as efficient as whipping a tired horse, the editor of the *Journal of the American Medical Association* suggests. (June 5)

Benzedrine sulfate seems to be a useful medicine when taken under a physician's direction. It is too new to warrant any prediction, however, as to possible permanent harm that may result from its continued misuse.

Science News Letter, June 12, 1937

ENGINEERING

50,000,000-Year-Old Sabertooth Not a Tiger

SABERTOOTH tigers, that yowled bloodthirstily in Western woods a million years ago, did not invent the sabertooth idea. The same long, curved, murderous weapons projected from the jaws of an entirely different kind of animal fifty million years ago, long before the cat family began to develop.

So cat-like was this early sabertooth animal that only an examination of the internal tooth structure proved it to be a counterfeit cat. Prof. William Berryman Scott, noted paleontologist, has given it a scientific name from the Greek, which means just that: "apat," meaning false or counterfeit, and "aelurus," meaning cat, combine into *Apataelurus*.

The creature, which lived in early Eocene time, belonged to the mammal group known as creodonts, a primitive, quite generalized carnivorous type. One line of descent of these creodonts "independently acquired the characteristics of the true sabertooth tiger," Dr. Scott stated.

The fossil on which Dr. Scott's identification was based was found in Utah by J. Leroy Kay of the Carnegie Museum, Pittsburgh. In recognition of this, Dr. Scott gave it the specific name *kayi*, so that it is *Apataelurus kayi*.

Science News Letter, June 12, 1937

ENGINEERING

What Will the Rivers Do Now?

New Great Dams Are Clearing Their Muddy Waters and Clear Water Cuts More; What Will Be Effect on Beds?

By DR. FRANK THONE

See Front Cover

AMERICA'S great rivers are rapidly being won away from the ranks of the unemployed. Boulder Dam has gone to work; its "juice" now pours over the wires clear to the Pacific shore, and before long the million thirsty throats of Los Angeles will be wet with Colorado river water. Norris Dam is generating light for thousands of homes in Tennessee Valley cities and countrysides. Day and night the walls of the Bonneville and Grand Coulee dams rise higher—and even in advance of their completion are generating more than a little political heat. Thousands of years ago Egypt had its Age of Great Pyramids; now America dwarfs these ancient wonders of the world with an Age of Great Dams.

Most of us, when we behold these wonders that our hands have wrought, focus our attention on the dams themselves, and on the giant power plants at their feet. We give a thought, perhaps, to the tremendous artificial lakes they have backed up into what were empty canyons only a little while ago, and we bestow a passing look on the masses of churned water pouring back into the channels below.

Few of us, however, give that discharged water more than a second glance. Its work is finished, it has yielded its energy for conversion into electricity; it is now only a liquid exhaust, an aquatic ash, differing from other power-plant waste only in that it obligingly goes to the dump itself, instead of having to be hauled there.

Downstream Questions

Engineers, though, do not take quite so careless or inconsequential a view of that spent water. These fussy folk, trained to think quantitatively where the rest of us only guess qualitatively, still have questions to ask about that water even after they have squeezed all the electric juice out of it that they can get on a paying basis, and after they have taken toll of it for city use and irrigation.

So long as water moves, it is developing energy—doing work on something. It is the engineer's business to know about energy and work—how much, where applied, what doing. So he looks downstream from the dam, and asks his questions.

But he doesn't always get his answers on the spot. Frequently he has to take the river indoors with him, into his testing laboratory, and repeat the questions there.

Of course it isn't possible to take such mighty streams as the Colorado or the Columbia into even the biggest engineering laboratory. That would prove both expensive and messy. But for at least some of the answers a small copy of the river will do almost as well as the original, just as marine engineers can figure out the best lines for an ocean liner or a battleship by towing a model through a long tank, or predict the mile-high behavior of a Zeppelin or a new-type airplane by putting small replicas of them into a wind tunnel.

Wooden River

So when engineers began asking themselves, a short while ago, what the Colorado was going to do with itself and its channel after it has "gone through the works" at Boulder Dam, they did not try to answer it at Boulder. They came back to Washington, D. C., and in the laboratories of the National Bureau of Standards they built a wooden river. It didn't look at all like the Colorado at Boulder Canyon, to be sure, but it did incorporate the particular factors that were giving concern to the engineers.

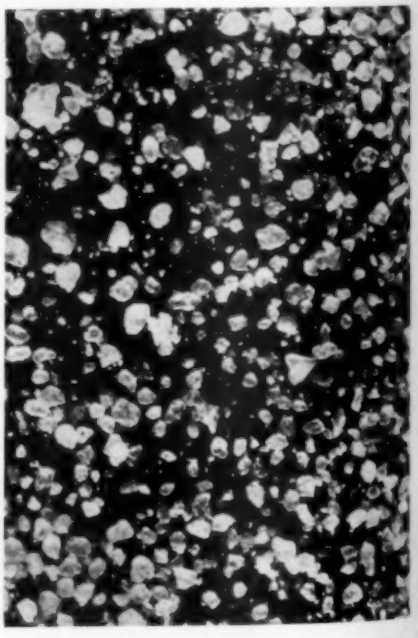
What they most wanted to know, in the particular downstream problem at Boulder Dam, was what the Colorado waters would do to the bottom of the river. Would the "scour" be faster or slower, now that the water gushes forth without the heavy load of silt it bore in the days before the dam was built?

For the water that comes out at the foot of the dam at Boulder—or of any dam, for that matter—is not the same as water in pre-dam days. A rapidly flowing river always carried along with it a considerable amount of mineral particles—sand and silt. The faster it flows the larger are the individual particles that it can carry, and also the larger is the total load.

When a dam is thrown across such a river, creating an artificial lake, the river behaves just as it does when it flows into the still water of a natural lake, or of the sea. It loses its velocity, and thus becomes unable to carry its load of mineral particles. The larger ones drop out first and the finer particles later. A delta is formed; the reservoir begins to silt up. The water becomes very much clearer than it was in the old original stream; only the invisibly fine particles, that are in what is technically known as the colloid state, remain in suspension as the water leaves the dam.

Inevitable Silt

Silting up is something that happens to all dams. When a dam-created reservoir has become completely silted up, the dam of course is useless. The lifetime of a dam is measured, among other things, by the number of years it will take for the silting-up process to complete itself. Engineers figure lifetimes for dams, as they do for roads, skyscrapers, bridges, battleships and all the other works of man. They set these figures off against



SAND

A sample from the bottom of the Colorado River for study at the National Bureau of Standards. It is magnified several times.

TAKING THE RIVER INDOORS

At the University of Minnesota, engineers study stream action through the glass banks of an artificial river.

the cost and usefulness of the dams, when they are deciding whether given projects are economically justified.

With this silt out of it, what will the re-cleared waters do when it rushes out of the enormous tailraces of the power plants?

The Bureau of Standards engineers built their wooden river to find that out.

Technically, the apparatus is called a flume. But modern "flume" differs by only a letter from the ancient Latin "flumen," which means a river, so that to call the contrivance a wooden river is not just a bit of fancy.

The Bureau of Standards flume is forty feet long, twenty inches wide. On eight feet of its bottom, bottom sand from the Colorado river was placed, and water was flowed over that at various speeds and with varying amounts of stuff already in it. The muddy water that originally coursed through the canyon was imitated in the laboratory by churning up fine particles of clay in the supply tank from which it was pumped to the flume, until three and one-half per cent of the weight of the water was made up of clay.

The work of the miniature river on its bed with clear water flowing was compared with its work when muddy water was used. Muddy water was found quite appreciably less efficient in causing scour on the sand bed. To cause the same amount of scour as clear water, it had to flow ten per cent faster than clear water under similar conditions. Sands somewhat coarser than those of the Colorado river bed were tried in the flume also, and it was found that with these the necessary increase in the velocity of muddy water was considerably greater, running as high as 25 per cent.

The difficult problem now facing the engineers is to correlate the results obtained with the little wooden river in the laboratory with conditions in the actual Colorado river, which is about 350 feet wide and 120 feet deep below the dam and travels about ten times as fast as the laboratory river, yet has the same sand bed. The exact answer to this question is not possible under the present state of hydraulic knowledge, but the results of this investigation indicate that a greater scouring away of the sand bed may be expected in the Colorado when clear water flows over it than was the case with the original muddy water. It is expected also that this scouring will progress gradually downstream.

While the results of this specific experiment will not apply directly to conditions below the other big dams now under construction or already in use, the general principle that clear water is a better "picker-upper" than muddy water will doubtless occupy the attention of engineers who stand at damsites and look downstream elsewhere. Where a river flows over a rocky bottom, the increased scouring effect of clear water will be a matter of less concern; but there are very few large rivers of this nature. Most of them, like the Colorado, have beds of sand; others are muddy-bottomed. These can expect downstream deepening if they are dammed.

Stone-Lined Rivers

The question of sidewise cutting, or bank erosion, was not taken up by the engineers in their attack on this particular problem. But it seems reasonable to conjecture that as clear water will scour the bottom faster it will also be more likely to cut more rapidly into the banks. This would not be a matter of particular concern at Boulder, where the power plants and other structures have their foundations set in solid rock, but it might be of considerable practical significance on the lower Mississippi and on similar streams where whole cities stand on loose-grained alluvial earth, highly susceptible to cutting.

So important is the matter of channel control in the older countries that in many places in western Europe small but troublesome streams have been given artificial stone linings where the cost appeared justified. A conspicuous example is Oberammergau in Germany, famous for its great Passion Play. The little river that flows along one side of the town had a bad habit of roaring into flood, when a storm had swept over the high mountain valleys that feed it. Sometimes it did this during a performance season, causing the throngs of visitors no end of trouble and losing the Oberammergauer people a great deal of needed revenue. So before the last performance season, in 1930, the people voted a heavy loan and cleared and paved their unruly stream. It was fortunate they did so, too, because 1930 turned out to be a rainy year in upper Bavaria. Yet for the first time the river stayed within bounds.

Hydraulic laboratories are coming to be regarded as necessary equipment in the great engineering schools. They are needed not only for studies on the effects

of proposed dams such as the problem attacked by the Bureau of Standards, but for questions connected with levees, channel straightenings, diversions for industrial purposes, introduction of large sewers and other sudden additions of water, presence and removal of rocks, sandbars and artificial obstacles, and a score of other things that engineers need to know.

A novelty is the "glass river" used at the University of Minnesota. This is a flume with sides of glass instead of wood or metal. This permits the research engineer to study the up-and-down weaving of the currents, as well as their sidewise and eddying motion—a kind of observation not possible either with the older type of flume or with the rivers themselves.

Abroad, hydraulic laboratories are a story at once old and new. In such countries as France and Germany, engineers had them to work with before they were known in America. On the other hand, they came to Russia only since the Revolution. But Russia is a land of mighty rivers, resembling the United States in that respect at least, and the Soviet engineers are trying to make up for lost time by building the "biggest ever," when they have a hydraulic problem to tackle.

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Science News Letter, June 12, 1937

MEDICINE

Little Grains of Starch Stop Growth of Cancer

A HINT that starch grains injected into cancerous tumors will stop their growth and in many cases cause them to disappear is contained in one of the 33 cancer researches in America and abroad supported by the International Cancer Research Foundation grants totaling over $300,000.

This hopeful experiment was made on a mouse tumor by Prof. Robert Chambers and C. G. Grand, of New York University's Department of Biology.

Injections of starch grains "produced a marked infiltration of polymorphonuclear leucocytes into the tumor." Leucocytes or white blood cells are the soldiers of the blood stream that fight invading germs. The accumulation of leucocytes inhibited further growth of the tumor and, in many cases, the tumor disappeared completely. Inert particles, like charcoal, did not produce the effect. So far the method has been applied to mice only.

The ultimate solution of the cancer, "the greatest unsolved problem in medicine today," will come from research by well-trained investigators, said W. H. Donner, president and founder.

"Why is there so little money for cancer research?" asked Mr. Donner. "The answer lies probably in the fact that research appeals only to the intellect. Hospitalization and treatment for the amelioration of suffering make an obvious emotional appeal to a large public; the alleviation of pain is humanitarian, and a necessary function of civilized society.

"The solution of the cancer problem, however, is an intellectual rather than an emotional matter, because it will come from research. Essential though care and treatment are, they can not be of the slightest help in preventing the development of malignant disease in the next sufferer. For him or for her, hope lies in the laboratories."

Human cancer cells and tissues have been kept growing for years in glass dishes and fed artificially, the report of the Johns Hopkins Cancer Research and Tissue Culture Laboratories reveals. The "J. D." human tumor strain has been maintained in pure and continuous tissue culture for 5½ years and an "A R." strain has existed 4 years. A number of human brain tumors had been cultured for almost a year when the report was submitted.

A new theory of cancer formation is suggested by experiments of Dr. A. Haddow of the University of Edinburgh. Chemicals from coal tars produce certain kinds of cancers and the new idea is that these carcinogenic hydrocarbons actually inhibit growth of the cells instead of stimulating them. The cancer is believed to result from the rise of a new cell race that rebels from the prolonged retardation of the growth of normal cells and multiplies rapidly forming the cancer.

Science News Letter, June 12, 1937

PSYCHOLOGY

Study Debunks Idea That Geniuses Are Born Queer

IF MEN of genius are eccentric or insane, it is not because all geniuses are born queer, but possibly because of lack of understanding in their education and family life, Dr. Harvey Zorbaugh, director of the Clinic for the Social Adjustment of the Gifted, New York University, told an audience at the Woods Schools, Langhorne, Pa.

Among a hundred gifted children whose development is being watched at the Clinic, five are so extremely gifted as to be clearly in the class of potential genius. In terms of IQ, these children all score at or above 180; a "normal" score is 100. One child registered 204 on this mental scale; the others were respectively 180, 190, 196 and 200. Such genius is rare, Dr. Zorbaugh said. Probably not more than 24 would be found in all New York's 1,086,416 public school children.

All are well adjusted, socially competent young persons, Dr. Zorbaugh told the Conference on Education and the Exceptional Child meeting at Langhorne.

"In three generations of the five families of these children there is but one relative who may be suspected of a psychotic episode," he said. The mother of one child is eccentric although it has never been necessary to put her in a hospital. All the other relatives seem

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In the Science Service series of radio discussions over the Columbia Broadcasting System.

to be, or to have been, normally adjusted and stable personalities. All the families are long lived and have good health histories.

At present these young prodigies are tall, healthy children ranging in age from five to fifteen—all of them normal mentally, physically and emotionally.

"We cannot predict the futures of these children," Dr. Zorbaugh said. "So far, they and their families have had careful guidance. The children have all had unusually fortunate educational experiences. If, as they grow older they become unstable, we believe it will be due to the Clinic's inability to control the hazards of development to which such children are exposed. . . .

"If society showed the interest in its children of genius that it shows in its idiots, we might speak more confidently. We spend millions of dollars yearly, for research and education, on our feebleminded.

"An equal amount invested in our gifted and talented children would yield an immeasurably rich return—in a deeper understanding of the nature of giftedness and talent, in the increased social productivity of the gifted elements of our human population."

Science News Letter, June 12, 1937

MEDICINE

New Human Disease Found; Resembles Rabbit Ailment

A NEW brain disease of man, which closely resembles a disease that attacks rabbits in many parts of America and Europe, was described by Drs. Abner Wolf and David Cowen of New York at the meeting of the American Neurological Association at Atlantic City.

The new disease has the imposing name of granulomatous encephalomyelitis. It is caused by a tiny egg-shaped organism which attacks the brain. The New York doctors reported a case of this disease in an infant born in New York City of American parents and dying at 4 weeks of age with widespread inflammation of the brain, spinal cord and retina of the eye. A similar case has been reported in an infant in Brazil and another in Czecho-Slovakia.

The condition of the infant's brain was much like that seen in rabbits afflicted with a brain disease due to a parasite called *Encephalitozoon cuniculi*, and the germ or organism found in the dead baby's brain was very similar to the one that causes the rabbit disease.

Insulin Shock Danger

Insulin shock, much heralded treatment for the widespread mental disease, schizophrenia, may itself produce a serious brain disease of another sort, with symptoms like paralysis agitans. Warning of this possibility was given by Drs. Baldwin L. Keyes, Herbert Freed and Helena E. Riggs of Philadelphia.

Previous warnings on the use of insulin shock treatment for mental disease have had to do with the possibility of the patient dying before he could be given enough sugar to bring him out of the shock.

Serious insulin shock may and sometimes does cause serious brain changes, the Philadelphia doctors asserted. These may result in after-effects like those in some cases of epidemic encephalitis, so-called sleepy sickness. The condition, with its rigid muscles, immobile facial expression, tremors and cramps, is like paralysis agitans.

A case of possible brain hemorrhage following insulin shock, in which the patient was temporarily paralyzed on one side, was also reported by the Philadelphia doctors.

X-Ray Treatment of Brain

A definite limit to X-ray dosage which can be used safely and effectively in treating brain cancer was set up by Drs. Percival Bailey, J. E. A. O'Connell and A. Brunschwig of Chicago.

"Any result which cannot be obtained by a depth-dose of 4,500 roentgen units," they state, "will not be obtained by higher dosage."

Further dosage, they said, may cause serious brain damage.

Science News Letter, June 12, 1937

GENERAL SCIENCE

Fear World Faces Disaster; Scientists Urged To Rally

SCIENCE is so universally useful that it is nurtured and praised by capitalist and communist, dictator-dominated states and democracies, peace enthusiast and war lord.

Because research and science are used for unsocial purposes so often, the ideal of a "brotherhood of scientists" has fallen into a general decline. In certain sections of the world where thought and truth are strait-jacketed, scientists can not participate in free interchange of opinion.

In this precarious state of the world's intellectual life, the rising tide of concern over the social consequences of science's applications is a hopeful sign. Latest of these efforts to orient and kindle the scientific spirit is the suggestion that the International Council of Scientific Unions take the lead in co-ordinating what has been proposed.

The task is as difficult as it is large. It requires bravery of the first rank and keen appreciation of the complex factors that intertwine governmental and industrial systems. It requires a scientific approach that admits mistake even though that new set of facts may dethrone righteous emotion.

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unclothed with the financial power of capital, the scientific worker and investigator will often find himself likely to lose job and prestige if he "knows the truth" and lets others know that he knows it. In countries nearer the breaking point than ours, he may find himself in jail or worse.

Scientists the world over are aroused with the fear that scientific progress may be losing the race with social instability. They see disease, poverty and war shackling the human mind and spirit. They have a vision of what the scientific spirit and human understanding could bring to the world. Scientists are so few numerically, yet given a rallying point they might be the leaven that will cause the world to rise from its social despondency.

Science News Letter, June 12, 1937

PHYSICS

Wallpaper Patterns Linked To Atoms in Study of Design

LYING abed, sick or wakeful, in a room papered in a prominent pattern may lead one to believe that the ways a wallpaper pattern can be varied are limitless.

Take it from those who know—not wallpaper manufacturers but crystallographers of the Massachusetts Institute of Technology—that there are only 17 different ways in which the basic design can be repeated on the paper.

This science of design is a sort of by-product of a more intricate task, the study of crystal structure. Each crystalline compound in chemistry is a structure of atoms. The tiny crystals, whose atoms can be detected only by powerful instruments, can be thought of as three-dimensional wallpaper. In three dimensions, or space, patterns can be arranged in 230 different ways, as contrasted with the 17 of repeating a given motif on a plane or two-dimensional surface.

The more complex problem of crystal structure is important in understanding nature's or man-made chemical compounds so useful in medicine, industry, and other fields. In these compounds the atoms composing them may be as close together as one ten-trillionth of an inch. Scientists studying photographs of X-rays diffracted by crystals, which reveal the patterns, must be able to measure to one five-hundredth of an inch on the photographic film.

The two-dimensional patterns are not confined to wallpaper. They may be found in neckties, dresses, tiling, textile weaves, prints on linoleum, carpets, etc. Professional designers and those who like to work out such puzzle problems just for the fun of it will be interested in studying the article about wallpaper and atoms that appears in the *Technology Review* (June 1937) written by Prof. M. J. Buerger and J. S. Lukesh.

Science News Letter, June 12, 1937

A nail driven into a tree four or five feet above ground will not "grow up" with the tree, but will remain at that height however tall the tree becomes.

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ICHTHYOLOGY

NATURE RAMBLINGS by Frank Thone

Shark Curiosities

SHARKS have swum the world's waters for well over a third of a billion years—since Silurian geologic times. They have been a successful family from the start—numerous as individuals, prolific in the evolution of new species, aggressive, adaptable.

Sharks, like all other fishes, have numerous species in what might be called the standard fish form: streamlined body with its greatest diameter well forward of amidships, a flaring tail, moderate-sized fins. A form like trout or codfish or carp.

From that form, however, they vary in all sorts of ways. Just as the higher fishes have produced the long and snaky eel, so also there is an eel-shaped shark. It is an exceedingly rare fish, first found in Japanese waters and since discovered in a scattered few places in the warmer seas.

Then there are the flat-bottomed sharks, that habitually lie on the bottom like flounders, except that they are flattened in the opposite direction and lie on their bellies instead of their sides. Of such are all the skates and rays, including the vicious stingrays and the stingless but portentously huge devilfish or manta of the tropic seas.

One of the strangest of these is a creature that has the wide side-extensions of its body partly supported on a pair of arm-like extensions, so that they look almost like wide sleeves. With its pointed head projecting between them like a bishop's mitre, this shark so impressed an early French naturalist that he described it as "a sea monster in the robes of a bishop."

Science News Letter, June 12, 1937

*First Glances at New Books

Additional Reviews On Page 384

Hygiene

NATIONAL HEALTH SERIES: EXERCISE AND HEALTH—Jesse Feiring Williams, 70 p.; VENEREAL DISEASES—William F. Snow, 98 p.; HOW TO SLEEP AND REST BETTER—Donald A. Laird, 83 p.; TAKING CARE OF YOUR HEART—T. Stuart Hart, 110 p.; THE COMMON COLD—W. G. Smillie, 77 p.; THE COMMON HEALTH—James A. Tobey, 96 p.; THE HEALTHY CHILD—Henry L. K. Shaw, 108 p.; THE EXPECTANT MOTHER AND HER BABY—R. L. DeNormandie, 89 p.; ADOLESCENCE—Maurice A. Bigelow, 99 p.; WHAT YOU SHOULD KNOW ABOUT EYES—Park Lewis, 82 p.; CANCER—Francis Carter Wood, 102 p.; DIABETES—James Ralph Scott, 132 p.; FOOD FOR HEALTH'S SAKE—Lucy H. Gillett, 74 p.; HEAR BETTER—Hugh Grant Rowell, 83 p.; LOVE AND MARRIAGE—T. W. Galloway, 102 p.; TUBERCULOSIS—H. E. Kleinschmidt, 77 p.; WHY THE TEETH—Leroy M. S. Miner, 71 p.; YOUR MIND AND YOU—George K. Pratt, 126 p.; STAYING YOUNG BEYOND YOUR YEARS—H. W. Haggard, 89 p.; THE HUMAN BODY—Thurman B. Rice, 88 p.—*Funk & Wagnalls,* 35c per volume; 3 for $1. The original National Health Series, published about twelve years ago, has enjoyed a distribution of over two million copies. In preparing this new twenty-volume series, the ten most popular volumes of the previous series were completely revised and brought down-to-date—the other ten are now published for the first time. The volumes are written by authorities, edited by the National Health Council.

Science News Letter, June 12, 1937

Psychology

GENERAL PSYCHOLOGY, BRIEFER COURSE—Floyd C. Dockeray—*Prentice-Hall,* 372 p., $2.50. This elementary text has been prepared by elimination of some of the more technical parts from the author's revision of his "General Psychology." Some illustrative material from daily life has been substituted for laboratory experiments.

Science News Letter, June 12, 1937

History

ENGLISH COSTUME OF THE EARLY MIDDLE AGES: THE TENTH TO THE THIRTEENTH CENTURIES—Iris Brooke—*Macmillan,* 87 p., illus., $2.25. The pictures, many in colors, rightly dominate this attractive book. They show, not merely costumes and accessories, but even gestures and poses of the era, thus adding to their value as reference material. Text with each page of drawings points out important features of dress and custom.

Science News Letter, June 12, 1937

Organic Chemistry

LABORATORY PRACTICE OF ORGANIC CHEMISTRY—G. Ross Robertson—*Macmillan,* 326 p., $2.25. Especially valuable in this laboratory manual by the associate professor of organic chemistry in the University of California at Los Angeles is the unusually extensive and informal treatment of principles underlying laboratory manipulation. Not only that, but the material and experiments presented are related to practical work and written simply and entertainingly.

Science News Letter, June 12, 1937

Criminology—Medicine

MEDICAL ASPECTS OF CRIME—W. Norwood East—*Blakiston's,* 437 p., $6.50. Present lack of knowledge in this field and the importance of a scientific approach to criminal problems are stressed by the author, who served for over twenty years as Prison Medical Officer in Great Britan and later was Medical Inspector of Prisons, Prison Commissioner, and head of the Prison Medical Service. He discusses the medical aspects of prison administration, attempted suicide, the fallacies of phrenology as related to crime, mental inefficiency and its effect on adolescent crime, sterilization and the mental disease resulting from prison confinement. This book carries a foreword by Sir John Simon.

Science News Letter, June 12, 1937

Anthropology

SKELETAL MATERIAL FROM SAN JOSÉ RUIN, BRITISH HONDURAS—Wilfred D. Hambly—*Field Museum,* 19 p., illus., 30c.

Science News Letter, June 12, 1937

Archaeology

KHORSABAD. Part I: Excavations in the Palace and at a City Gate—Gordon Loud—*Univ. of Chicago,* 139 p., 129 illus., $10. A beautifully published report of Oriental Institute researches.

Science News Letter, June 12, 1937

Anthropology

THE QUINAULT INDIANS—Ronald L. Olson—*Univ. of Washington,* 194 p., $2. Univ. of Washington Publications in Anthropology, vol. 6, no. 1.

Science News Letter, June 12, 1937

Nutrition

FEEDING OUR CHILDREN—Frank Howard Richardson—*Crowell,* 159 p., $1. A simple and practical book that will prove helpful to many a mother. An unusual feature is the chapter on food for the college age girls and boys. Young persons, or older ones, for that matter, who have to feed themselves away from home on a limited budget will find helpful hints in these concluding pages.

Science News Letter, June 12, 1937

Physiology

THE LITTLE THINGS IN LIFE—Barnett Sure—*Appleton-Century,* 340 p., $2.50. The book includes among the "little things" vitamins, hormones, digestive ferments and pollens and other allergens—minute causes of much trouble in the form of hay fever, asthma, hives, migraine and the like. The book is written for the thoughtful lay reader.

Science News Letter, June 12, 1937

Anesthetics

INHALATION ANESTHESIA: A FUNDAMENTAL GUIDE—Arthur E. Guedel—*Macmillan,* 172 p., $2.50. A practical text by the associate clinical professor of surgery in the University of Southern California. Should prove useful to students of medicine and surgery.

Science News Letter, June 12, 1937

Archaeology

ARCHAEOLOGICAL EXPLORATIONS IN PERU: PART III; TEXTILES OF THE EARLY NAZCA PERIOD—Lila M. O'Neale, 99 p., illus., $3.50; PART IV; CANETE VALLEY—A. L. Kroeber, 52 p., illus., $1.50, *Field Museum.*

Science News Letter, June 12, 1937

PSYCHOLOGY OF SEX
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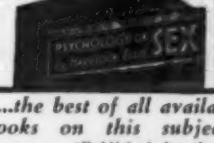
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—PARTIAL CONTENTS—
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5-DAY MONEY-BACK GUARANTEE
Emerson Books, Inc., Dept. 43-S, 251 W. 19th St., N.Y.C.

•First Glances at New Books

Additional Reviews On Page 383

Psychiatry

PERSONALITY AND THE CULTURAL PATTERN—James S. Plant—*Commonwealth Fund,* 432 p., $2.50. In the Essex County Juvenile Clinic the author had the opportunity to observe children experiencing their first breakdown under the particular pressures of their environment. At that Clinic, the author states, they are interested not only in "straightening out the child" but in assuring those responsible for institutions surrounding him that his conduct was an understandable and natural response to the pressures placed upon him. From a study of these children the author has arrived at certain implications for the school, the church, law, medicine and industry.

Science News Letter, June 12, 1937

Education—Bibliography

AUDIO-VISUAL AIDS FOR TEACHERS IN JUNIOR AND SENIOR HIGH SCHOOLS, JUNIOR COLLEGES, ADULT EDUCATION CLASSES—Mary E. Townsend and Alice G. Stewart—*H. W. Wilson,* 131 p., 75c. A comprehensive list of sources from which may be obtained such teaching aids as wall maps, charts, posters, pictures, motion picture films, exhibits and models.

Science News Letter, June 12, 1937

Home Management

IF YOU'RE GOING TO LIVE IN THE COUNTRY—Thomas H. Ormsbee and Richmond Huntley—*Crowell,* 257 p., illus., $2.50. Very practical suggestions to homeseekers who leave the city and seek a place of their own with a few acres and a few trees around it. How to overcome rural lacks of city conveniences, what to provide for in building a new house, how to find and recondition an old one, and especially a chapter on trouble-shooting in a country house. A unique book and a valuable one.

Science News Letter, June 12, 1937

Motion Picture Photography

AMATEUR MOVIES & HOW TO MAKE THEM—Alex Strasser—*Studio,* 80 p., plates, $3.50. Any amateur movie enthusiast will learn much from this practical book (of British origin), splendidly illustrated with over thirty pasted-in plates.

Science News Letter, June 12, 1937

Natural History

HOP, SKIP AND FLY: STORIES OF SMALL CREATURES—Irmengarde Eberle — *Holiday House,* 71 p., illus., $2. Stories of individualized frog, bat, snakes, etc., told for quite-young readers, with illustrations very good indeed. It is a pity, however, that animals represented so well in their natural actions should be made to "think" and "talk" to themselves and their young.

Science News Letter, June 12, 1937

Agriculture

SOD-HOUSE DAYS; LETTERS FROM A KANSAS HOMESTEADER, 1877-78—Howard Ruede, edited by John Ise—*Columbia,* 248 p., $2.75. These letters, subsequently edited into quasi-diary form, tell of pioneer effort, disappointment, triumph, in far more humanly vivid terms than whole shelf-fuls of books that might be labeled History of Agriculture in the Prairie and Plains Regions, or some such title. They were written in the late seventies by a Pennsylvania-German emigrant to Kansas. And when you get through reading them you will really know something of the beginnings of Kansas.

Science News Letter, June 12, 1937

Zoology

THE DACHSHUND OR TECKEL: A COMPLETE TREATISE ON THE HISTORY, BREEDING, TRAINING, CARE AND MANAGEMENT —WITH CHAPTERS ON DISEASES AND THEIR TREATMENT—Herbert C. Sanborn —*Orange Judd,* 383 p., illus., $3. People used to laugh at the Dachshund, but now that he has become a dog for "smart" persons to own, we are beginning to take him almost as seriously as he does himself. For the Dachshund is as serious as any German philosopher—and more intelligent than some of them. If you contemplate buying a Dachshund, you should read this book first; if you already have one, here is where you can find out more about him.

Science News Letter, June 12, 1937

Anthropology

PUEBLO MATERIAL CULTURE IN WESTERN UTAH—Julian H. Steward—*Univ. of New Mexico,* 64 p., illus., 50c. Univ. of New Mexico Bulletin No. 287.

Science News Letter, June 12, 1937

Journalism

THE DAILY NEWSPAPER IN AMERICA: THE EVOLUTION OF A SOCIAL INSTRUMENT —Alfred McClung Lee—*Macmillan,* 797 p., $3.50. Comprehensive, detailed and accurate, this history of journalism will be enlightening to those who read newspapers and invaluable to those who make them.

Science News Letter, June 12, 1937

Agronomy

CONSERVATION OF THE SOIL—A. F. Gustafson—*McGraw-Hill,* 312 p., illus., $3. A new applied science, soil conservation, has been born within the past few years, and its literature is receiving additions daily. In particular, textbooks are rapidly appearing, to be used in the training of the young men now in school to whom we must look for the land's salvation. This one appears adequate to all reasonable requirements, in its application of the principles of ecology, engineering, soil geology, forestry, and other older disciplines to the solution of the newly faced problems. Illustrations show soil devastation and the means to conquer it, through contouring, terracing, plantings, and special soil-handling machinery.

Science News Letter, June 12, 1937

Biography—Agriculture

PIONEERING IN AGRICULTURE: ONE HUNDRED YEARS OF AMERICAN FARMING AND FARM LEADERSHIP—Thomas Clark Atkeson and Mary Meek Atkeson—*Judd,* 222 p., $3. The story of a pioneer in the movement for the betterment of farm life in America, as participated in by one of the first leaders of the National Grange, told to his son and daughter-in-law and arranged into connected narrative form. A valuable sourcebook for those interested in the history of modern agriculture.

Science News Letter, June 12, 1937

Botany

OKLAHOMA FLORA—Thomas R. Stemen and W. Stanley Myers—*Harlow,* 706 p., illus., $6. Oklahoma is a problem state, floristically. Although it does not lie strictly within the boundaries of the "Gray's Manual territory," it has many plants belonging there, and it also has affinities with the South and the Plains. To make sure of your identification of an Oklahoma plant therefore would necessitate checking against several manuals. It is gratifying to have answers to all taxonomic questions a botanist might reasonably want to ask in Oklahoma answered in this one volume.

Science News Letter, June 12, 1937

Chemistry

DURALUMIN AND ITS HEAT-TREATMENT —P. Litherland Teed—*Charles Griffin (Lippincott),* 116 p., $6.

Science News Letter, June 12, 1937